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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
|-----------------|-------------|----------------------|---------------------|------------------|

10/809,432

03/26/2004

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EXAMINER

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ART UNIT

PAPER NUMBER

2613

MAIL DATE

DELIVERY MODE

12/19/2008

PAPER

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The time period for reply, if any, is set in the attached communication.



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## DETAILED ACTION

### *Claim Objections*

1. **Claim 41** is objected to because of the following informalities:

In **claim 41**, “a third light source unit” is introduced. However, parent claim 24 already implies three light sources, i.e., (1) “an illumination light source”, (2) “one of said light sources”, and (3) “another of said light sources”. Thus, the “third light source unit” of claim 41 conflicts with the three light sources already introduced in parent claim 24. As a simple remedy, Examiner respectfully suggests amending claim 41 to read “a ~~third~~ fourth light source unit”.

Appropriate correction is required.

2. Applicant's response to the objection to **claim 47** in the previous Office Action (mailed on 13 June 2008) is noted and appreciated. Applicant responded by amending claim 47. Applicant's response overcomes the previous objection, which is presently withdrawn.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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5. **Claims 24, 43-52, 57, and 58** are rejected under 35 U.S.C. 103(a) as being unpatentable over Dowling et al. (WO 02/25842 A2, hereinafter "Dowling") in view of Hiramatsu (U.S. Patent No. 7,099,589 B1).

**Regarding claim 24**, Dowling discloses:

A communications system comprising:

a communications lighting apparatus (Dowling, Fig. 5) having an illumination light source adapted to emit illumination light (Dowling, light source 132) and an information-transmitting unit adapted to emit an optical signal (Dowling, transmitter 136),

wherein said information-transmitting unit is mounted on said illumination light source (Dowling, see the embodiment of Fig. 7. Notice the mounting of module 716 onto base 702 in Fig. 7. Module 716 is an output device that may emit an optical signal (p. 45, l. 17-19). Base 702 may be an illumination light source (p. 44, l. 17-21)).

Dowling does not expressly disclose:

wherein said information-transmitting unit has light sources, a light beam from one of said light sources being emitted independent of a light beam from another of said light sources.

However, these techniques are known in the art, as shown by Hiramatsu (Example 2 on col. 12, l. 45 – col. 14, l. 45, each of the multiple light sources of the multi-beam transmitter emits an independent light beam, all of the beams of the same wavelength, see col. 13, l. 62 - col. 14, l. 11; Example 1 on col. 5+, each of the multiple light sources of the multi-beam transmitter emits an independent light beam, all of the beams of different wavelengths, see col. 11, l. 27-45). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to include these techniques in the apparatus of Dowling. One of ordinary skill in the art would have been motivated to do this to provide the benefit of providing multiple communication channels for increased transmission rates or for communicating with multiple terminals (e.g., Hiramatsu, multi-beam transmitter 102 in Fig. 1 communicates with multiple terminals).

**Regarding claim 43**, Dowling in view of Hiramatsu discloses:

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A communications system according to claim 24, wherein said illumination light source intermittently emits another optical signal in a predetermined pattern (Dowling, various patterns on p. 37, last paragraph).

**Regarding claim 44,** Dowling in view of Hiramatsu discloses:

A communications system according to claim 24, wherein light beams from said light sources are of the same wavelength (Hiramatsu, Example 2 on col. 12, l. 45 – col. 14, l. 45, each of the multiple light sources of the multi-beam transmitter emits an independent light beam, all of the beams of the same wavelength, see col. 13, l. 62 - col. 14, l. 11).

**Regarding claim 45,** Dowling in view of Hiramatsu discloses:

A communications system according to claim 24, wherein light beams from said light sources are of different wavelengths (Hiramatsu, Example 1 on col. 5+, each of the multiple light sources of the multi-beam transmitter emits an independent light beam, all of the beams of different wavelengths, see col. 11, l. 27-45).

**Regarding claim 46,** Dowling in view of Hiramatsu discloses:

A communications system according to claim 24, wherein said information-transmitting unit includes a light source section (Dowling, transmitter 136), said light source section being adapted to emit said optical signal.

**Regarding claim 47,** Dowling in view of Hiramatsu discloses:

A communications system according to claim 46, wherein said optical signal includes said information (Dowling, transmitter 136 in Fig. 5 is an example of an emitter on p. 13, l. 11-14 that emits optical communication signals, which implies inclusion of information).

**Regarding claim 48,** Dowling in view of Hiramatsu discloses:

A communications system according to claim 24, wherein said information-transmitting unit includes an interface, said interface being adapted to receive an input signal from an external device (Dowling, implied by the connections between smart lighting devices 1 in Fig. 2).

**Regarding claim 49,** Dowling in view of Hiramatsu discloses:

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A communications system according to claim 48, wherein said information-transmitting unit includes a recording section (Dowling, e.g., buffer 97 in Fig. 3), said recording section being adapted to record said input signal (Dowling, data input at 65 is recorded on buffer 97, p. 35, l. 8-9).

**Regarding claim 50**, Dowling in view of Hiramatsu discloses:

A communications system according to claim 48, wherein said interface is a Universal Serial Bus (USB) (Dowling, p. 14, l. 6, "USB").

**Regarding claim 51**, Dowling in view of Hiramatsu discloses:

A communications system according to claim 48, wherein said interface is a fiber connector (Dowling, p. 14, l. 3, "fiber optics" implies some kind of fiber connector between smart lighting devices 1 in Fig. 2).

**Regarding claim 52**, Dowling in view of Hiramatsu discloses:

A communications system according to claim 24, wherein said information-transmitting unit has an emission band in the near-infrared band, the intermediate far-infrared band or a longer wavelength band (Dowling, infrared on p. 37, last paragraph).

**Regarding claim 57**, Dowling in view of Hiramatsu discloses:

A communications system according to claim 24, wherein said light sources emit said optical signal (Hiramatsu, e.g., the light sources of 102 in Fig. 1).

**Regarding claim 58**, Dowling in view of Hiramatsu discloses:

A communications system according to claim 57, further comprising:  
a mobile terminal device adapted to receive said optical signal (Dowling, e.g., mobile communication devices on p. 15, l. 3-20, portable devices on p. 48, l. 19-21).

6. **Claims 29 and 40** are rejected under 35 U.S.C. 103(a) as being unpatentable over Dowling in view of Hiramatsu as applied to the claims above, and further in view of Newton (*Newton's Telecom Dictionary*, 8th ed.).

**Regarding claim 29**, Dowling in view of Hiramatsu discloses:

A communications system comprising:

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a communications lighting apparatus (Dowling, Fig. 5) having an illumination light source adapted to emit illumination light (Dowling, light source 132) and an information-transmitting unit adapted to emit an optical signal (Dowling, transmitter 136),

wherein said information-transmitting unit has light sources, a light beam from one of said light sources being emitted independent of a light beam from another of said light sources (Hiramatsu, e.g., the independent sources of 102 in Fig. 1), and

wherein said information-transmitting unit includes a recording medium (Dowling, memory 150 in Fig. 5) and a reading section (Dowling, processor 140),

said reading section being adapted to read information stored in said recording medium (Dowling, notice the interaction between processor 140 and memory 150).

Dowling in view of Hiramatsu does not expressly disclose:

said recording medium being *removable* from said information-transmitting unit.

Notice that Dowling suggests that memory 150 can be any of a number of various types of memory (p. 39, last paragraph). Any suitable removable memory would be another obvious type of memory for Dowling. Various examples of removable memory are well known in the art, as exemplified by Newton ("removable media" (p. 868), "removable cartridge system" (p. 868), "floppy disk" (p. 452), and "floppy mini" (p. 453)). One of ordinary skill in the art would have been motivated to do this since removable memory is easy to replace, reprogram, and transport (e.g., Newton, the example of the "floppy disk" is easy to replace, reprogram, and transport).

**Regarding claim 40**, claim 40 introduces limitations that correspond to limitations introduced by claim 29. The corresponding limitations of claim 29 are addressed by teachings from Newton. Similarly, Newton is applied here to address the corresponding limitations of claim 40.

7. **Claims 41 and 42** are rejected under 35 U.S.C. 103(a) as being unpatentable over Dowling in view of Hiramatsu as applied to the claims above, and further in view of Brooks (U.S. Patent No. 5,218,466).

**Regarding claim 41**, Dowling in view of Hiramatsu does not expressly disclose:

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A communications system according to claim 24, further comprising a third light source unit adapted to emit a visible light beam.

However, such a visible light source unit is known in the art, as shown by Brooks (104 in Figs. 1 and 3). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to include such a visible light source unit in the apparatus of the prior art of record. One of ordinary skill in the art would have been motivated to do this to indicate the occurrence of an event (Brooks, abstract), which is a useful status indicator.

**Regarding claim 42**, Dowling in view of Hiramatsu and Brooks discloses:

A communications system according to claim 41, wherein said visible light beam indicates a region in which said optical signal emitted from said information-transmitting unit is receivable (Brooks, 104 in Figs. 1 and 3).

8. **Claims 53 and 54** are rejected under 35 U.S.C. 103(a) as being unpatentable over Dowling in view of Hiramatsu as applied to the claims above, and further in view of Ramaswami et al. (*Optical Networks: A Practical Perspective*, 2<sup>nd</sup> ed., hereinafter "Ramaswami").

**Regarding claim 53**, Dowling in view of Hiramatsu does not expressly disclose:

A communications system according to claim 24, wherein said information-transmitting unit has an end-plane emission semiconductor laser used as a light source.

However, this type of laser is well known in the art for providing optical sources for optical communications, e.g., a Fabry-Perot laser as shown in Ramaswami (p. 167-168). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to employ such a laser to provide a light source of Dowling. One of ordinary skill in the art would have been motivated to do this since it is commonly known that lasers generally provide stronger communication signals than the LEDs of Dowling (p. 37, last paragraph).

**Regarding claim 54**, Dowling in view of Hiramatsu does not expressly disclose:

A communications system according to claim 24, wherein said information-transmitting unit has a vertical-plane emission semiconductor laser used as a light source.



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However, this type of laser is well known in the art for providing optical sources for optical communications, e.g., a VCSEL as shown in Ramaswami (p. 172-174). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to employ such a laser to provide a light source of Dowling. One of ordinary skill in the art would have been motivated to do this since it is commonly known that lasers generally provide stronger communication signals than the LEDs of Dowling (p. 37, last paragraph).

9. **Claim 55** is rejected under 35 U.S.C. 103(a) as being unpatentable over Dowling in view of Hiramatsu as applied to the claims above, and further in view of Service ("Hot New Beam May Zap Bandwidth Bottleneck").

**Regarding claim 55**, Dowling in view of Hiramatsu does not expressly disclose:

A communications system according to claim 24, wherein said information-transmitting unit has a quantum-cascade semiconductor laser used as a light source.

However, this type of laser is well known in the art for providing optical sources for optical communications, e.g., a QCL as shown in Service (entire article). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to employ such a laser to provide a light source of Dowling. One of ordinary skill in the art would have been motivated to do this since it is commonly known that lasers generally provide stronger communication signals than the LEDs of Dowling (p. 37, last paragraph).

10. **Claim 56** is rejected under 35 U.S.C. 103(a) as being unpatentable over Dowling in view of Hiramatsu as applied to the claims above, and further in view of Ramaswami and Service.

**Regarding claim 56**, Dowling in view of Hiramatsu does not expressly disclose:

A communications system according to claim 24, wherein said information-transmitting unit is a combination of an end-plane emission semiconductor laser, a vertical-plane emission semiconductor laser, and a quantum-cascade semiconductor layer.

However, these various types of lasers are all well known in the art for providing optical sources for optical communications, e.g., a Fabry-Perot laser and a VCSEL in Ramaswami (p. 167-168, 172-174) and a QCL in Service (entire article). At the time the invention was made, it would have been obvious to

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one of ordinary skill in the art to employ any or all of them in any combination in the information-transmitting unit of Dowling. One of ordinary skill in the art would have been motivated to do this since it is commonly known that lasers generally provide stronger communication signals than the LEDs of Dowling (p. 37, last paragraph).

11. **Claim 59** is rejected under 35 U.S.C. 103(a) as being unpatentable over Dowling in view of Hiramatsu as applied to the claims above, and further in view of Leeb et al. (U.S. Patent No. 6,198,230 B1, hereinafter "Leeb").

**Regarding claim 59**, Dowling in view of Hiramatsu does not expressly disclose:

A communications system according to claim 58, wherein said mobile terminal device is adapted to display contents of said optical signal.

However, the mobile terminal devices of Dowling include devices that conventionally comprise displays, such as cellular telephones (Dowling, p. 15, middle paragraph) and portable computers (Dowling, p. 15, last two lines). Additionally, the technique of displaying the contents of a received signal is extremely common in the art; see an example in Leeb (Fig. 10). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to arrange such displays to display the contents of the optical signal received. One of ordinary skill in the art would have been motivated to do this for any number of common reasons for displaying the contents of a received signal, such as to verify the proper reception of the received signal or to alert a user about an improper reception of the received signal.

#### **Response to Arguments**

12. Applicant's arguments filed on 12 September 2008 have been fully considered but they are not persuasive. Applicant presents six salient points.

**Regarding the first point**, Applicant states:

Thus, Figure 5 of Dowling fails to teach a communication system wherein said information-transmitting unit has light sources, a light beam from one of said light sources being emitted independent of a light beam from another of said light sources.

(REMARKS, p. 12, 3<sup>rd</sup> paragraph, emphasis Applicant's).

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Examiner respectfully notes that the standing rejections **already** recognize this point. Accordingly, the standing rejections apply suitable teachings from Hiramatsu to address this point. Therefore, this point is not persuasive.

**Regarding the second point**, Applicant states:

Thus, Figure 5 of Dowling fails to teach a communication system wherein said information-transmitting unit is mounted on said illumination light source.

(REMARKS, p. 12, middle paragraph, emphasis Applicant's).

Examiner respectfully notes that the standing rejections rely on the embodiment of **Fig. 7** of Dowling to address this limitation. That is, notice the mounting of module 716 onto base 702 in Fig. 7. Module 716 is an output device that may emit an optical signal (p. 45, l. 17-19). Base 702 may be an illumination light source (p. 44, l. 17-21). Therefore, this point is not persuasive.

**Regarding the third point**, Applicant states:

Thus, Figure 7 of Dowling fails to teach a communication system wherein said information-transmitting unit has light sources, a light beam from one of said light sources being emitted independent of a light beam from another of said light sources.

(REMARKS, p. 14, 1<sup>st</sup> paragraph, emphasis Applicant's).

Examiner respectfully notes that the standing rejections **already** recognize this point. Accordingly, the standing rejections apply suitable teachings from Hiramatsu to address this point. Therefore, this point is not persuasive.

**Regarding the fourth point**, Applicant states:

However, Hiramatsu fails to disclose, teach, or suggest a communications system wherein said information-transmitting unit is mounted on an illumination light source.

(REMARKS, p. 12, middle paragraph, emphasis Applicant's).

Examiner respectfully notes that the standing rejections do not rely on Hiramatsu to address this limitation. Rather, this limitation is **already** addressed by teachings from the primary reference of Dowling. That is, notice the mounting of module 716 onto base 702 in Fig. 7. Module 716 is an output device that may emit an optical signal (p. 45, l. 17-19). Base 702 may be an illumination light source (p. 44, l. 17-21). Therefore, this point is not persuasive.

**Regarding the fifth point**, Applicant states:

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Thus, Brooks fails to teach a communication system wherein said information-transmitting unit has light sources, a light beam from one of said light sources being emitted independent of a light beam from another of said light sources.

(REMARKS, p. 15, 3<sup>rd</sup> paragraph, emphasis Applicant's).

Examiner respectfully notes that the standing rejections do not rely on Brooks to address this limitation.

Rather, this limitation is addressed by teachings from Hiramatsu. Therefore, this point is not persuasive.

**Regarding the sixth point**, Applicant states:

Leeb, Newton, Ramaswami and Service - Leeb, Newton, Ramaswami and Service either individually or as a whole, fail to disclose, teach, or suggest a communications system wherein said information-transmitting unit is mounted on an illumination light source.

Moreover, Leeb, Newton, Ramaswami and Service either individually or as a whole, fail to disclose, teach, or suggest a communications system wherein said information-transmitting unit is mounted on an illumination light source.

(REMARKS, p. 15, 4<sup>th</sup> and 5<sup>th</sup> paragraphs, emphasis Applicant's).

Examiner respectfully notes that the standing rejections do not rely on to Leeb, Newton, Ramaswami and Service address this limitation. Rather, this limitation is addressed by teachings from the embodiment of Fig. 7 of Dowling. Therefore, this point is not persuasive.

**Summarily**, Applicant's arguments are not persuasive. In general, Applicant's points constitute a series of piecemeal analyses of the references. However, in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. Accordingly, Examiner respectfully maintains the standing rejections.

### **Conclusion**

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID S. KIM whose telephone number is (571)272-3033. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth N. Vanderpuye can be reached on 571-272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. S. K./  
Examiner, Art Unit 2613

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Supervisory Patent Examiner, Art Unit 2613